

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



A280.2609  
C 76

## UNITED STATES DEPARTMENT OF AGRICULTURE

SEVENTH ANNUAL COOPERATIVE SOYBEAN OIL MILLS CONFERENCE  
ON PROBLEMS OF COOPERATIVE SOYBEAN OIL MILLS

at the

Hanford Hotel  
Mason City, Iowa

May 3-4, 1954

## Conference Sponsored By:

AGRICULTURAL RESEARCH SERVICE  
NORTHERN UTILIZATION RESEARCH BRANCH  
Peoria, IllinoisFARMER COOPERATIVE SERVICE  
COTTON AND OILSEEDS BRANCH  
Washington, D. C.NORTH IOWA COOPERATIVE PROCESSING ASSOCIATION  
Mason City, Iowa

## PROGRAM

Chairman: Mr. C. E. Rist, Acting Chief  
Northern Utilization Research BranchMay 3:

9:30 Welcoming Remarks by

Glenn Pogeler, Manager, North Iowa Cooperative Processing  
Association, Mason City, Iowa  
andLeslie Milligan, Secretary, Chamber of Commerce, Mason City,  
IowaRemarks by Dr. W. W. Fetrow, Farmer Cooperative Service,  
Washington, D. C.Remarks by Mr. C. E. Rist, Acting Chief, Northern Utilization  
Research Branch, Peoria, Illinois

"Effect of Agitation on Stability of Hydrogenated Soybean Oil"

E. B. Lancaster, Chemical Engineer, Oilseed Group, Engineering and Development Section, Northern Utilization Research Branch

"Color of Soybean Lecithin in Relation to Processing Conditions"

H. J. Dutton, In Charge, Fundamental Oil Investigations Group, Oil and Protein Section, Northern Utilization Research Branch

"Recent Findings on the Toxicity of TESOM (Trichloroethylene Extracted Soybean Oil Meal)"

L. L. McKinney, In Charge, Industrial Protein Group, Oil and Protein Section, Northern Utilization Research Branch

"Urease Tests for Control of Cooking Soybean Oil Meal"

Allan K. Smith, In Charge, Protein Properties, Isolation and Food Use Group, Oil and Protein Section, Northern Utilization Research Branch

12:30 Luncheon

1:30 "Color Characteristics and Chemical Analysis of Oil From Frost- and Weather-Damaged Soybeans"

Duncan Macmillan, Chemist, Analytical, Physical-Chemical and Physics Section, Northern Utilization Research Branch

2:00 Chairman: Dr. W. W. Fetrow, Chief  
Farmer Cooperative Service

"Procurement Problems of Cooperative Soybean Oil Mills"  
Panel Discussion:

Maurice Maze, Manager, M.F.A. Cooperative Grain and Feed Company, Mexico, Missouri

S. O. Frey, Manager, Producers Cooperative Association, Girard, Kansas

C. W. Hanson, Manager, Big 4 Cooperative Processing Association, Sheldon, Iowa

"Government Programs As They Affect Producers and Processors of Cottonseed and Soybeans"

Glenn Pogeler, Manager, North Iowa Cooperative Processing Association, Mason City, Iowa



May 4:

9:00 Chairman: Dr. W. W. Fetrow, Chief  
Farmer Cooperative Service

"Has Operation to Date Justified Conversion to Solvent  
Extraction"

Ed Olson, Manager, Boone Valley Cooperative Association,  
Eagle Grove, Iowa

and

Glenn Pogeler, Manager, North Iowa Cooperative Processing  
Association, Mason City, Iowa

12:30 Luncheon

2:00 Guided tour of facilities of North Iowa Cooperative Processing  
Association

Adjournment

## PROCEEDINGS

General Chairman: Dr. Ward W. Fetrow

May 3, 1954 - Morning: Chairman, Mr. Carl E. Rist

The meeting was opened by Dr. Fetrow who introduced Mr. Glenn Pogeler, Manager, North Iowa Cooperative Processing Association. The North Iowa Co-op served as host for the visitors. Mr. Pogeler welcomed those attending the meeting and read several communications from mill representatives who were unable to be present. He then introduced Mr. Leslie Milligan, Secretary of the Mason City Chamber of Commerce who described industrial growth in the area and extended the city's hospitality to the visitors present. After self-introductions by all attending the meeting, Dr. Fetrow commented as follows:

We are very glad to see so many representatives of the Cooperative Soybean Oil Mills present at our meeting here this morning. Your presence here shows that you are interested in working together to improve the operation of your own cooperative business. As you know, this is our seventh meeting. Mr. McVey and I were discussing our first meeting this morning. Even after the arrangements were made for that first meeting, we were very apprehensive as to whether or not many of you folks would be interested in attending a conference of this kind. After six years, we can say that the attendance at and the interest in these meetings have been far greater than we at first anticipated.

When these meetings were started, we knew that we could not tell you folks how to operate your soybean oil mills. We did have an idea, however, that we might be of service in getting information to you that would be helpful in your operations. We thought this would be possible in at least three ways.

In the first place, we knew that each of you had a great deal of knowledge of a technical, economic and cooperative nature regarding the operations of the mills represented here. We thought that if this knowledge could be pooled and made available to each of you individually, it would be of great help to each one of you. This exchange of information has been made possible by your frank and open discussion of your problems with each other.

In the second place, we felt it would be of great value to you in your operations if you could be kept currently advised of the results of the research at the Laboratory relating to the problems of soybean processing. These meetings have made it possible for you to keep informed of current developments in research of interest to you. Your acquaintance with the Laboratory staff and the work which they are doing has also made it possible for you to make suggestions as to new research projects which might be undertaken.



In the third place, we knew there was a great amount of data on your operations in your annual audits and in your offices which could be very helpful to you if properly assembled and analyzed. We have attempted to prepare these data so you can compare your own operating results with each of the other mills.

You people, as representatives of the mills, are largely responsible for the success of these meetings. Your cooperation in attending the meetings, your willingness to discuss your problems frankly and freely, and to make information available to us for comparison with other mills have been very fundamental to the success of these conferences. In saying this, I do not want to detract one iota from the contribution the staff of the Northern Regional Research Laboratory has also made. They have given us wholehearted cooperation and made their facilities available to us. Without the cooperation and assistance of the Laboratory, these meetings could not have contributed to the improvement of your operations as much as they have.

We also want to acknowledge the fine cooperation and encouragement the Banks for Cooperatives have given in many ways and their contributions to the success of these conferences.

We have emphasized repeatedly that these are your meetings and should be conducted according to your own wishes. The rest of us are only working for you.

Mr. C. E. Rist, Chairman of the Monday morning program was then introduced by Dr. Fetrow. Mr. Rist explained the purpose of the research on grains, oilseeds, and agricultural residues at the Northern Utilization Research Branch and introduced the first speaker, Mr. E. B. Lancaster. Abstracts of the talks given in the morning session and questions and comments on these talks follow.

Mr. E. B. Lancaster, Chemical Engineer, Engineering and Development Section, NURB

Mr. Lancaster discussed the "Effect of Agitation on the Stability of Hydrogenated Soybean Oil."

When refined soybean oil and hydrogen gas are brought together at an elevated temperature in the presence of a reduced nickel catalyst, they combine to give hydrogenated soybean oil. Agitation is required to keep the catalyst suspended in the oil and to facilitate contact between the oil and gas. The character of the agitation, as well as other factors such as temperature and pressure, has an important effect on the properties of the hydrogenated oil.



The result of combining hydrogen with the oil is to increase the melting temperature, firmness and stability of the oil. During the hydrogenation of soybean oil any and all of the unsaturated acids may be reduced. The reduction of the monounsaturated fatty acid increases the hardness of the product, whereas reduction of the tri- and di-unsaturated acids, and particularly of the triunsaturated acid, increases the stability of the product. However, the reaction is discontinued before the oil has become completely hydrogenated, so that the melting point and firmness will not be increased beyond that which is required for a suitable margarine oil or a suitable shortening. Hydrogenated oil for use in margarine must have a melting point of about 98° F. so that it will melt in the mouth when it is eaten. The melting point of shortening is usually somewhat higher. Margarine and shortening should also have suitable consistencies for spreadability or workability.

The stability of hydrogenated soybean oil is important to the consumer when it is used in shortening and margarine for prepared baked and fried foods. The length of time these products, or foods made therefrom, may be kept on the grocer's shelf before they become rancid or otherwise poor flavored is usually related to the stability of the oil. When hydrogenated oil is used for frying foods, stability determines how soon the oil will become rancid. The stability of a hydrogenated oil having suitable physical properties may vary widely depending on the conditions for hydrogenating the oil. Conditions for hydrogenating the oil which favor a high stability are termed selective conditions. It is obvious that a high degree of selectivity during the hydrogenation reaction is desirable. In other words, before the limiting hardness is attained, it is desirable to have reduced relatively large proportions of the tri- and diunsaturated acids. Experiments were conducted in the pilot plant to find the most selective type of agitation.

In attempting to conduct hydrogenation in a more selective manner, it was found that the use of an agitator of new design gave a product with enhanced stability. The agitator draws hydrogen gas from the headspace above the oil in the hydrogenator and disperses it in the oil in the form of small bubbles. This type of gas dispersion agitator produces a more stable hydrogenated oil apparently because the oil is kept more nearly saturated with hydrogen gas during the reaction.

Mr. Rist then introduced Dr. H. J. Dutton, Chemist, Oil and Protein Section, NURB, who discussed the "Color of Soybean Lecithin in Relation to Processing Conditions."

The production and utilization of soybean phosphatides has been increasing over the past several years. This increased use has come primarily because a number of companies have competed with one another to dispose of this byproduct of soybean oil at prices above that of



soap stock fatty acids. Approximately 50 million pounds of soybean phosphatides are potentially available, but only 20 million are being produced and sold. One factor which limits their utilization is the brown color which is formed during the processing of the oil and isolation of the gums. At the present time phosphatides are selling at approximately oil prices while the bleached phosphatides are selling at a slightly higher price. However, purified phosphatides are selling at \$7 a pound for pharmaceutical uses. These phosphatides are valuable as emulsifying agents, additives to food for nutritional improvement, and therapeutic agents.

The color of soybean lecithin is due to carotenoids, brown pigments, and occasionally porphyrins. In water-washing of crude oil, xanthophylls are preferentially removed with the gums, and carotene is practically absent in lecithin. Lutein is the principal carotenoid, comprising about three-quarters of the carotenoids in lecithin. Hydrogen peroxide bleaching destroys all the color to some extent, but by far the greater effect is on the carotenoids.

The brown color is very likely an aldehyde amine reaction product. It is largely formed by heating of the oil during the solvent-stripping operation. It is not increased by drying the gums under vacuum for 3 hours at 80° C., but it is increased on heating at 100° C. under the same conditions. The formation of the brown color is not prevented by removal of free sugars or by hydrogenation of the lecithin.

Future work on the color and browning in soybean phosphatides will include studies on the analytical relation of fluorescence of the oil and phosphatides to the development of brown color. An attempt will be made to develop a simple fluorescence test which will measure the extent of browning and heat damage during the various steps of processing.

In conclusion Dr. Dutton stated that many interesting and potentially valuable substances are present in soybean gums and future research is expected to uncover methods of recovering and utilizing these materials. The extent of the market for purified lecithin for therapeutic purposes is not known at present.

After a recess Mr. Rist introduced Mr. L. L. McKinney, Chemist, Oil and Protein Section, NURB, who discussed "Recent Findings on the Toxicity of Trichloroethylene-Extracted Soybean Oil Meal (TESOM)."

The first two years of investigations initiated by the NURB for the purpose of studying the toxicity of TESOM has recently been completed. This work includes that carried out under contracts by the Agricultural Experiment Stations of Iowa and Minnesota. The great variation in degree of toxicity exhibited by different preparations of TESOM's is



attributed to at least two factors: (1) highly toxic meals result from processing beans within 4 or 5 months after harvest while beans that have been stored through the winter before processing have always yielded meal of lowered toxicity; (2) not all meals processed from new beans are highly toxic, for example, desolventization at low temperatures (under 90° C.), produces lowered toxicity. TESOM's from 10 of the 11 plants that have operated in the United States following World War II have been tested and all were found to be toxic to cattle, although as much as 3,000 to 4,000 lbs. were required to produce clinical symptoms in some cases. Both new and used solvent produced highly toxic meals from new beans and rather extensive studies have failed to incriminate the autoxidation products of trichloroethylene. Reduced growth has been consistently observed when TESOM was substituted for screw-pressed and hexane-extracted soybean oil meal in the diets of swine, chickens, turkeys, and guinea pigs. Whether this effect stems from toxicity or reduced protein value has not been determined. There is evidence to indicate that highly toxic TESOM's affect species other than cattle. Fractionation studies to date show that the toxic principle resides in the crude protein fraction. These studies are being pursued in the hopes that the toxic principle may be isolated and identified.

In reply to questions, Mr. McKinney said that swine did not develop a hemorrhagic condition when they were fed TESOM although they showed reduced growth. When guinea pigs were fed TESOM free choice, they ate less than when they were fed hexane-extracted soybean oil meal in the same manner. At present no extraction plants for soybeans or other oilseeds are operating with trichloroethylene. However, this solvent is being used in one plant to extract fat from tankage and meat scraps, and the extracted protein is being used for feeding swine. No toxicity study has been made of the extracted tankage.

Mr. Rist then introduced Dr. A. K. Smith, Chemist, Oil and Protein Section, NURB, who discussed "Urease Tests on Soybeans."

The importance of cooking or toasting soybean oil meal to attain maximum nutritional value and the need for laboratory tests rather than time-consuming animal feeding tests for control of this operation were discussed. The moisture content of the meal as well as the time and temperature of toasting are the important factors in efficient toasting.

There are a number of publications describing laboratory investigations on toasting in relation to nutritional value, but because of the wide differences between laboratory and plant operation these laboratory results cannot be translated with assurance to large-scale operation. A number of different laboratory tests have been proposed and tried as a means of processing control; the two which have been used most



are the nitrogen solubility test or as it is now known, nitrogen solubility index (NSI), and the urease test. Several different methods for each of these tests have been investigated to find the most dependable one. The need for determining the compatibility of soybean oil meal with urea was also discussed.

The modified Caskey-Knapp, the Hafner, and Du Pont methods for determining urease in soybean oil meal were described and demonstrations of two of these methods were given. Although these methods fall short of the ultimate objective required for good quality control, they are very useful in plant operation. Research is still in progress at the Northern Utilization Research Branch on processing control methods which will make possible a uniform, high quality product throughout the processing industry.

Following his talk, Dr. Smith supplied detailed directions for performing the urease tests to many who were interested in using them for product control in their plants. After Dr. Smith's talk, the meeting was adjourned for lunch.

For the first talk of the afternoon, Mr. Rist introduced Dr. Duncan Macmillan, Chemist, Analytical, Physical-Chemical, and Physics Section, NURB, who discussed "Color Characteristics and Chemical Analyses of Oil from Frost- and Weather-Damaged Soybeans."

This is an extension of earlier work on the green grading of crude soybean oil. The paper presented at last year's meeting was, in a sense, a study of maturity series. Most of the soybeans used in that work were from one planting of a single variety. They were harvested at several stages of maturity and artificially frosted. Thus, they showed only green damage.

To extend the work and make it more generally applicable, naturally frosted and weather-damaged soybeans and green oils were obtained from cooperative and other mills. The oils from these beans were extracted with trichloroethylene. This solvent, rather than hexane, was used because it extracts pigments far more thoroughly, and our object was to obtain dark oils.

Because the previous study was based on a definite series, the analytical data showed very regular trends as functions of ripeness of the beans. Refining loss, free fatty acid, and color decreased markedly with maturity while iodine value increased. In the work reported this year, the same trends were noticeable but not with the same regularity. This is not surprising because the samples were obtained at random, and there were varying amounts of weather damage added to the frost damage. More noticeable this year than last was the high refining loss of oil from weather-damaged beans. The worst was as high as 39 percent loss. Weathering also produced unusual

responses to the bleaching of refined oil. In some instances there was little or no difference in color of oil whether a neutral or activated bleaching earth was used. In other cases, the difference in color between the two bleaches was more than would be expected for "normal" oils. Thus, the bleach test on these abnormal oils is not a reliable guide to subsequent treatment in the plant.

It is of interest that only two green oils in the entire investigation would be subject to the green grade penalty. These two, both screw-press oils, when refined and bleached gave very light products, so that the green grade penalty was greater than the refined, bleached color discount. According to NSPA rules, the greater discount can be applied, but not both.

Following Dr. Macmillan's talk, Mr. Rist turned the meeting back to Dr. Fetrow.

May 3, 1954 - Afternoon: Chairman, Dr. W. W. Fetrow

Maurice Maze, Manager, M.F.A. Cooperative Grain and Feed Company, Mexico, Missouri

Mr. Maze, in discussing "Soybean Procurement Problems," stated:

1. The volume of beans needed depends, in large part, upon the crushing capacity of the plant.
2. Also tied in with the volume needed, is the demand for meal. The mill must be able to sell at the best possible advantage.
3. Supply of beans is important. Great advantage to have needed beans as close to mill as possible.
4. Transit privileges can affect the supply of beans and may make the difference between profit and loss.
5. Membership relations is probably the most important item in bean procurement. At their mill they have 1400 individual farmers as members plus the M.F.A. Exchanges that cover the entire State. They receive beans from farmers and elevators. It is necessary to maintain contact with the membership and to keep up the interest in the mill. This is done by:
  - a. Showing the member that he is benefiting financially by getting the market price for beans plus patronage dividends most of the time.



- b. Holding a monthly meeting of the Board of Directors at which a complete financial statement is presented.
  - c. Holding an annual patrons meeting in the spring where it is stressed that the plant is their facility.
  - d. Maintain personal contact as much as possible. This is fairly easy during the bean harvest and wheat harvest when the patrons bring these commodities to the plant.
6. Tying in with the above is the 400,000 bushels of storage provided for the use of farmers. Farmers can use this storage and avoid selling during the harvest period when prices are usually lower. By the use of this storage farmers have made over \$1,000,000 in the past seven years.
7. The only time they advance less than the market price is when a farmer wants to put his beans in the loan.
8. Every truck load of soybeans is graded.

Sheldon Frey, Manager, Producers Cooperative Association, Girard, Kansas

Mr. Frey, in discussing their "Procurement Problems," pointed out that they are located in the heart of the Southeast Kansas soybean belt and their supply of beans is nearby. Most beans are received direct from farmers in truck lots and they have little or no transit. They are able to procure beans pretty well in line with market prices and they pay the market price at time of delivery. Their membership is made up of 900 farmers who are Class A members and 75 cooperative elevators who are Class B members. Class B members have no vote.

The most important problem is maintaining contact with members. Close contact is necessary. The Association issues a monthly bulletin to the membership. They have a retail store which the members visit often. The Board of Directors, composed of farmers from all parts of the territory, meets monthly. A financial statement is presented and discussed. Being able to pay a patronage refund at the end of the year is an excellent way of maintaining membership loyalty.

Every load of beans was graded last year for the first time. This was necessary due to the excessive amount of weed seed in the beans which in turn was due to the drought that reduced bean growth.

Charles W. Hanson, Manager, Big 4 Cooperative Processing Association,  
Sheldon, Iowa

Mr. Hanson, in discussing "Procurement Problems" described their set-up:

They are owned by 42 elevators within a 60 mile radius. All beans are received from elevators - none direct from farmers. The Association crushes about one-half the beans that it buys and sells one-half to other processors. They operate a 6 screw press plant and operate the year round. They store a 4 to 5 months supply of beans in the member elevators. The beans are paid for at the time of sale and storage is paid to the elevator until the beans are moved out. Transit is good and is used extensively. However, due to the increase in rail freight rates, they are considering going to trucks. They have gone into bulk meal handling and most of the meal goes back to member elevators. Gives good service on meal and tries to be competitive throughout the year. They have built up trade with independent dealers.

Each of the 42 elevators has a representative on the Board of Directors and this Board meets every other month, which, in effect, amounts to six stockholders' meetings each year. A financial statement is presented and discussed. The executive committee of the Board meets in those months when the full committee does not meet. This procedure keeps the membership informed. Patronage dividends are important. They use revolving fund financing.

Dr. Macmillan asked about farm storage of beans. Mr. Maze said that it could be done if there are not too many weed seed in the beans. Insects are not a particular problem. However, farmers like to store their beans in elevators at the time of harvest to avoid handling more than one time. In response to a question on storage costs, Mr. Maze said they charged a cent per bushel every 25 days plus 1/2 cent per bushel each time the beans were turned plus 50 cents for every \$1,000 valuation for insurance. Mr. Hanson said they paid 1 1/2 cents per bushel per month to the elevators.

Mr. Pogeler raised a point regarding how many beans a processor can afford to own. With beans around the \$4 level, it is costing the processor 15¢ to 18¢ per bushel for storage and interest. He suggested that the processors might be better off if they had a lot more meal storage and a lot less bean storage. This could help out a lot in the orderly marketing of meal.

Mr. Kubler asked about dockage in beans. Mr. Hanson said 2 1/2% at the outside in the Sheldon area and Mr. Pogeler said under 2%. Mr. Frey said that due to the drought last year and the resulting increase in weed seed, their average was 8%. Mr. Maze said their average last year was 4% for the same reason. These figures are much higher than normal.



Dr. Fetrow raised a question regarding the make up of the Boards of Directors of the mills and the frequency of meeting. Most of the Directors felt that a meeting each month was enough to keep them pretty well informed. Many of the Directors and the mill managers, in particular, felt that the mill Board should have some elevator managers on it. They are more familiar with current markets and problems and can make valuable contributions in operating policies of the mill. They were emphatic in saying that the mill Board should not be composed entirely of elevator managers but should have members and Directors of the elevators on the Board also. After all, these are the people who own the elevators and mills and grow the soybeans.

There was some discussion of practices of cooperative soybean oil mills of paying current market prices for soybeans at the time of delivery. All of the mills follow that practice. They all agreed it would be very difficult to change and advance any amount less than market price since farmers are accustomed to receiving the current market price upon delivery. It was brought out that advancing the full market price places the cooperative in direct competition price-wise even though they follow established market prices. Some expressed the view that the cooperative should be able to meet competitive prices in the open market at the time products are delivered. And if the cooperative cannot meet competitive prices then the members are justified in delivering elsewhere. In other words, the member is to be an "opportunist" as far as patronizing his cooperative is concerned. When the question was posed as to whether a director should be allowed to deliver his products outside for a slightly higher price the answer seemed to be "no." In other words, in the minds of some, there was a different standard of loyalty for the member and for the board of directors.

The above discussion led into an exploration of just what are some of the fundamental concepts of farmer cooperatives and just what are the objectives. It was pointed out that farmers go together to establish a business of their own on a mutual basis, they provide the money to finance it, and they own and control it. Then is it logical for them to refuse to patronize the business they own and control, even if they can temporarily get more elsewhere? The whole problem here seems to be pretty well summed up in the one word "confidence."

It is difficult to understand sometimes why farmers do not have more confidence in their own cooperative business from which they get all savings over and above necessary expenses of operation. Some suggested it was lack of understanding of the way cooperatives function. Others thought membership was made too easy and as a result, farmers looked upon their cooperative the same as any other business.



Glenn Pogeler, Manager, North Iowa Cooperative Processing Association,  
Mason City, Iowa

Mr. Pogeler discussed "Government Programs As They Affect Producers and Processors of Cottonseed and Soybeans."

Mr. Pogeler briefly reviewed the history of the two support programs and pointed out that for 1954, supports on soybeans had been lowered to 80 percent of parity while cottonseed would be supported at 75 percent, the same as last year. The price at which cottonseed products (oil, meal, linters) will be supported at the processor level has not been determined. Acreage allotments have been ordered on cotton for 1954 which may substantially reduce the amount of cottonseed. With no restrictions on soybeans acreage and with normal yields, around 350,000,000 bushels could be produced compared to the 260,000,000 bushels last year. Exports of soybeans from last year's crop will amount to 40,000,000 to 45,000,000 bushels. With lower prices in 1954, even more beans may be exported.

The Government's policies with respect to disposing of surplus products also affects growers and processors. The acquisition and present stocks of cottonseed products, particularly cottonseed oil, is a burden on the market. Disposal of cottonseed meal last year in the drought relief program seriously affected the protein market. The current disposal program on dried milk may affect meal prices.

Mr. Pogeler also brought in the political angle and pointed out how the cotton people all stick together. They keep their congressmen and senators informed and it has paid off. Soybean people could learn a lot from them. Trade Associations could also be used to a much better advantage.

May 4, 1954 - Morning: Chairman, Dr. W. W. Fetrow

Edward Olson, Manager, Boone Valley Cooperative Processing Association,  
Eagle Grove, Iowa

and

Glenn Pogeler, Manager, North Iowa Cooperative Processing Association,  
Mason City, Iowa

Mr. Olson opened the discussion on "Has Operation to Date Justified Conversion to Solvent Extraction" by explaining that their plant hadn't been in operation very long and that all operating figures quoted would be from the time of start-up thru April and would cover a lot of trouble and down time. Some of the results:

Product yields - Oil 10.92 lbs. - has improved

Meal 49.96 lbs.

Total 60.88 lbs.



Total operating expense per bushel 23¢ which excludes feed plant labor but does include taxes and depreciation on the whole plant. A breakdown on some of the major items shows:

Salaries	4.40¢ per bu.
Fuel	1.16 per bu.
Power	1.83 per bu.
Interest	1.83 per bu.
Insurance	.24 per bu.

The conversion job cost about \$650,000 which includes 125,000 bushels of storage at \$83,000, extraction building \$34,000 and a warehouse 80' by 100' costing \$33,000.

In response to a question on capacity, Mr. Olson said the plant was designed for 200 tons per day. They are running 175-200 tons or less than capacity since they don't have enough beans to run them through the year.

In conclusion, Mr. Olson said their hexane loss had been high because of the starts and stops. No average on fat in meal but had reached a low of .76 percent. No average on protein content of meal but it has varied from 46% to 51%.

Mr. Pogeler said their plant had been in operation longer than Mr. Olson's and the figures he quoted would cover the period September 1, 1953 through April 30, 1954. Their throughput is now up to 193 tons per day. Product outturn:

Oil	10.88 lbs. per bu.
Meal	<u>49.76</u> lbs. per bu.

Total 60.64 lbs. per bu.

This has been on beans of 10 percent moisture with an oil content of 17.8 percent calculated on a 14 percent moisture basis. Protein content of meal has run 46.5 percent to 47.0 percent. Fat in meal has run .5 percent to 1.5 percent. This has been affected by a poor set of flaking rolls that became pitted and did not make a uniform flake. New rolls will enable them to lower fat content of meal and increase oil yield. He pointed out that the fat content of the spent flakes as they come from the D.T. is always lower than in the finished meal. They have made a good oil. Their average refining loss has been 3.3 percent.

With respect to operating costs, their total for the 8 months period has been 32¢ per bushel but was down to 24¢ for April. They should soon reach the 20¢ level as set up in the engineering plans. Labor, depreciation and interest make up about 20¢ of the 32¢. High bean prices have caused interest costs to be especially high. Depreciation rates have probably been set too high and are subject to adjustment.

A question was raised in regard to how often it is necessary to close down and what are the major trouble spots. Mr. Pogeler answered that unless something happened, a two-day shut down should be scheduled every 90 days to clean up the still, etc. They haven't closed down for a schedule stop because other troubles have occurred. Their bean heater blew up in November and again in January. This enabled them to do the necessary repair and clean-up work. In connection with the bean heater, he said that business interruption insurance sure paid off for them. With respect to trouble spots, he mentioned conveyors, flaking rolls, cracking rolls and hammers in the hammer mill. They have had little or no trouble with the extractor.

D. H. McVey, Farmer Cooperative Service, Washington, D. C.

Mr. McVey distributed and briefly discussed a series of 4 tables dealing with operating information that had been furnished by the mills. One of the tables showed a comparison of solvent and screw press operating data for the quarter ending December 31, 1953 and was the most interesting to the group. This table showed that depreciation and interest costs for the solvent mills was very high as compared to the screw press mills. The group asked that the future quarterly operating cost reports for the mills carry three averages: solvent mills, screw press mills and all mills combined.

Meeting for 1955

The group asked that another meeting be held in 1955. Mr. Frey made a motion that the 1955 meeting be held at the Northern Regional Research Laboratory as early in May as possible. Mr. Nolin seconded the motion and it was carried by a vote of 6 to 3 with most of the group abstaining.

Mr. Pogeler explained that he had attended a similar meeting of the cooperative cottonseed oil mill people in New Orleans in March and had got a lot of good from that meeting. He advanced the idea of holding a joint meeting of the two groups for next year. After discussion of the possibilities of this, Mr. Nolin made a motion to rescind the previous motion and for the Chairman (Dr. Fetrow) to appoint a committee of three or more persons to decide on plans for next year's meeting. This motion was carried with no opposing votes. The Chairman appointed the following Committee:

Glenn Pogeler, Chairman  
Maurice Maze  
Chuck Hanson  
Al Reisz  
Karl Nolin

This same group is to act as the Program Committee.



It was suggested that representatives from the two crushing groups might get together at the annual meeting of the American Soybean Association. Since this meeting is to be held in Memphis the last of August, it will probably be a convenient time for the two groups to get together. Mr. Pogeler was to contact Mr. Otho Key, Chairman of The Cottonseed Meeting and Program Committee.

May 4, 1954 - Afternoon: Chairman, Glenn Pogeler

The afternoon was spent in a guided tour of the new 200-ton solvent plant of the North Iowa Cooperative Processing Association conducted by personnel of the Association.

LIST OF ATTENDANCE

Farm Cooperative Associations

Alward, Lee, Big 4 Cooperative Processing Ass'n., Sheldon, Iowa  
Apel, Elmer, North Iowa Cooperative Processing Ass'n., Nora Springs,  
Iowa  
Benard, Harry, Boone Valley Cooperative Processing Ass'n., Eagle Grove,  
Iowa  
Carstens, A. K., North Iowa Cooperative Processing Ass'n., Mason City,  
Iowa  
Claude, Victor, Boone Valley Cooperative Processing Ass'n., Woolstock,  
Iowa  
Crim, Floyd, Boone Valley Cooperative Processing Ass'n., Eagle Grove,  
Iowa  
Dean, Earl, North Iowa Cooperative Processing Ass'n., Mason City, Iowa  
Dueck, George, Co-Op Vegetable Oils, Ltd., Altona, Manitoba, Canada  
Enevoldson, Morris, Tri-County Co-op Soybean Ass'n., Dawson, Minnesota  
Enns, John, Co-Op Vegetable Oils, Ltd., Altona, Manitoba, Canada  
Frey, S. O., Producers Cooperative Ass'n., Girard, Kansas  
Funk, John, Co-Op Vegetable Oils, Ltd., Altona, Manitoba, Canada  
Givens, Joe, Tri-County Co-op Soybean Ass'n., Dawson, Minnesota  
Gregory, C. M., Farmers Cooperative Company, Dike, Iowa  
Hansen, Carl, Imperial Hay Growers Ass'n., Brawley, California  
Hanson, C. W., Big 4 Cooperative Processing Ass'n., Sheldon, Iowa  
Henage, Hiram, M.F.A. Co-op Grain and Feed Company, Mexico, Missouri  
Jurgens, R. W., West Bend Elevator Company, West Bend, Iowa  
Kubler, John, Southwest Flaxseed Ass'n., Imperial, California  
Lous, Charles, Boone Valley Cooperative Processing Ass'n., Eagle Grove,  
Iowa  
Maywald, Fred, Farmers Grain Dealers Ass'n., Des Moines, Iowa  
Maze, Maurice, M.F.A. Co-op Grain and Feed Company, Mexico, Missouri  
Mertens, Herman, Farmers Grain Dealers Ass'n., Des Moines, Iowa  
Nolin, Karl, Farmers Cooperative Ass'n., Ralston, Iowa  
O'Connell, Lawrence, Southwest Flaxseed Ass'n., Imperial, California  
Olsen, Ralph, Boone Valley Cooperative Processing Ass'n., Eagle Grove,  
Iowa  
Penning, L. M., Big 4 Cooperative Processing Ass'n., Sheldon, Iowa  
Peterson, H. S., North Iowa Cooperative Processing Ass'n., Mason City,  
Iowa  
Pogeler, Glenn, North Iowa Cooperative Processing Ass'n., Mason City,  
Iowa  
Rissler, Harold, North Iowa Cooperative Processing Ass'n., Mason City,  
Iowa  
Roffers, Tony, Northwest Co-op Mills, St. Paul, Minnesota  
Roberts, Delbert, North Iowa Cooperative Processing Ass'n., Mason City,  
Iowa  
Stoezinger, Richard, Farmers Cooperative Company, Dike, Iowa  
Schipul, R. E., Boone Valley Cooperative Processing Ass'n., Eagle Grove,  
Iowa



Smith, Frank, Farmers Cooperative Ass'n., Ralston, Iowa  
Thiessen, Jack, Co-Op Vegetable Oils, Ltd., Altona, Manitoba, Canada  
Teitjens, Harold, North Iowa Cooperative Processing Ass'n., Mason City,  
Iowa  
Toohey, Tom, Farmers Union Grain Terminal Ass'n., St. Paul, Minnesota  
Trick, Al, Farmers Grain Dealers Ass'n., Des Moines, Iowa  
Vetter, Paul D., Big 4 Cooperative Processing Ass'n., Lake Park, Iowa  
Webrle, Geo., North Iowa Cooperative Processing Ass'n., Mason City,  
Iowa  
Werner, Mel, Farmers Union Grain Terminal Ass'n., St. Paul, Minnesota

U. S. Department of Agriculture and Others

Beal, Robert, Northern Utilization Research Branch, Peoria, Illinois  
Dutton, H. J., Northern Utilization Research Branch, Peoria, Illinois  
Fetrow, W. W., Farmer Cooperative Service, Washington, D. C.  
Hoaglund, H. A., Zimmerman, Alderson, Carr Company, Chicago, Illinois  
Jackson, Donald, Agricultural Marketing Service, Washington, D. C.  
Lancaster, E. B., Northern Utilization Research Branch, Peoria, Illinois  
Langford, C. T., Northern Utilization Research Branch, Peoria, Illinois  
Macmillan, Duncan, Northern Utilization Research Branch, Peoria, Illinois  
McKinney, L. L., Northern Utilization Research Branch, Peoria, Illinois  
McVey, Daniel H., Farmer Cooperative Service, Washington, D. C.  
Rist, Carl E., Northern Utilization Research Branch, Peoria, Illinois  
Sherman, L. E., Omaha Bank for Cooperatives, Omaha, Nebraska  
Smith, Allan K., Northern Utilization Research Branch, Peoria,  
Illinois  
Volkin, David, St. Paul Bank for Cooperatives, St. Paul, Minnesota  
Yocum, George A., R. W. Booker and Associates, St. Louis, Missouri

